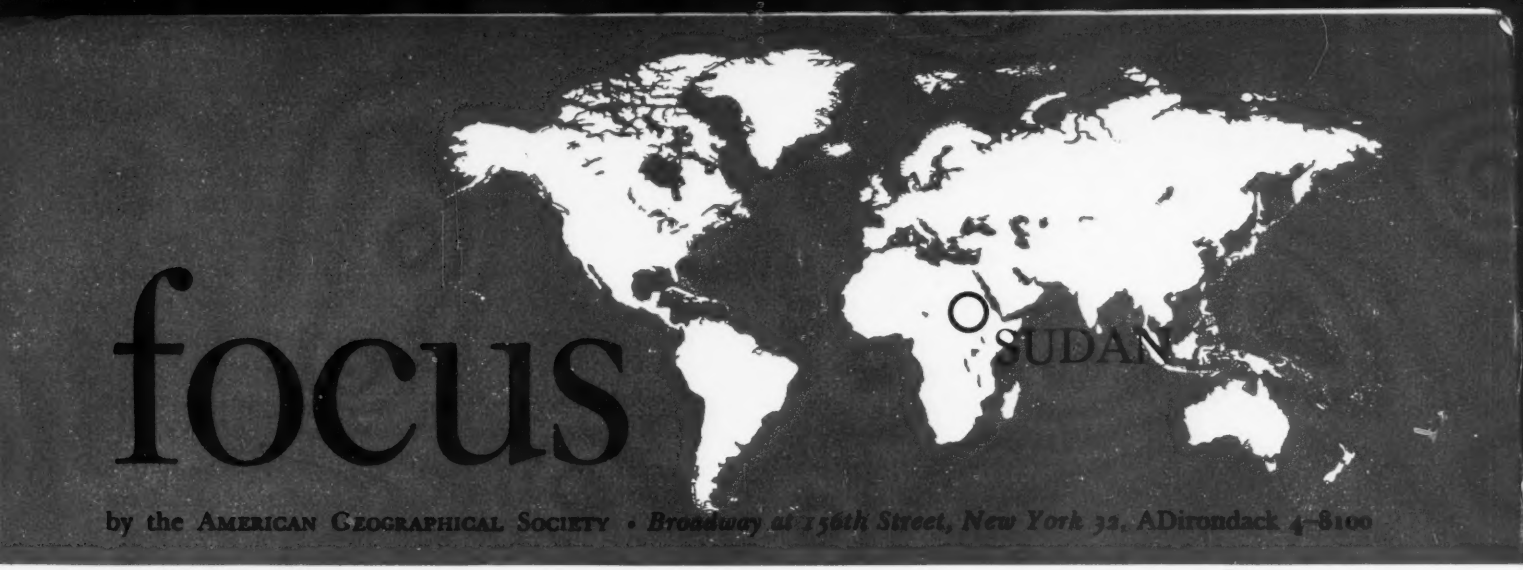


focus

by the AMERICAN GEOGRAPHICAL SOCIETY • Broadway at 156th Street, New York 32, ADirondack 4-8100

ALICE TAYLOR, EDITOR

VOL. VIII, NO. 5, January, 1958

The Sudan

At the end of World War II the Sudan was known to most of us as a vast underdeveloped territory administered by the British in alliance with Egypt. Subsequent discord in the Anglo-Egyptian Condominium, provoked to a considerable extent by the Sudan issue itself, and the accompanying Sudanese political development, focused world attention on this embryo state. National independence was achieved in January, 1956, when the new blue, yellow, and green flag was raised over Khartoum and the Republic of the Sudan was born.

Physically and culturally the Sudan, a territory of nearly a million square miles or a third the size of the United States, and a population of about 8,750,000, consists of two main regions. North of approximately 12°N. stretches a country of savanna and desert, culturally a part of the Middle East. Here Islam prevails, Arabic is spoken, and irrigation is practiced. South of this is a land of rivers and swamps, the ancient home of the Blacks, of nature worship, and long-horned cattle. Across these two regions from south to north flows the river Nile, upon which much of the economic life of the country depends.

THE LANDSCAPE AND THE WEATHER. The Sudan occupies an immense clay plain surrounded by uplands. The plain itself is essentially one of aggradation. When the highlands to the east arose (late Tertiary), the area south of Khartoum became a vast shallow depression, which gradually filled with fluvial and possibly some lacustrine sediments. The south-central portion of it is known as the *Sudd,* the Arabic term for the blockages in the drainage system composed of loosened swamp vegetation. The plain is further diversified by many small, steep-sided hills or groups of hills, frequently with the beehive outline characteristic of mechanical disintegration in arid climates. These hills, or *jebels,* are the unburied remnants of the original surface.

The Sudan is drained entirely by the Nile system. The Atbara, the Blue Nile, and the Sobat are the main streams flowing off the Abyssinian Plateau into the plain. The Bahr el Ghazal and its tributaries flow in from the Congo-Nile divide, and the Bahr el Jebel comes down from the Western Rift of Africa and the East African Plateau. These latter two rivers join in the southern Sudan to form the White Nile, which in turn joins the Blue Nile at Khartoum to form the Nile that crosses the desert to the Mediterranean Sea.

Climatically, the Sudan is transitional between the hot desert of the north and the tropical rainy

Copyright, 1958, by the American Geographical Society of New York

lands to the south. Average rainfall increases from practically zero at the boundary with Egypt to more than 50 inches in places along the Congo and Uganda frontier. Most of the rain comes during the summer or high-sun period, and is of the shower or thunderstorm type, falling in the afternoon and evening. Toward the south the rainy season extends over eight or nine months of the year, but here too July and August are the wettest months.

Average monthly temperatures are everywhere high; the highest daily and seasonal extremes occur in the northern desert. Temperatures at Khartoum may exceed 100° F. at any time of year. Summer heat is less severe in the south, but the relative humidity is higher. This is due to prolonged periods of cloud cover and the cooling effect of the rain itself. The hottest month of the year in these areas is usually the one just before the rains begin.

The sequence of natural vegetation from north to south is a reflection of the transitional nature of the climate. In the northern deserts large tracts are completely devoid of plant growth. As the amount of rainfall and the duration of the rainy season increase southward desert scrub comes first, followed by short-grass savanna. Tall-grass savanna is dominant over much of the south-central part of the country; and the south and southwest is mostly thin, dry woodland-grass savanna, except for broad areas of papyrus, reeds, and grasses in the swamps and some broadleaf forest in the lowlands.

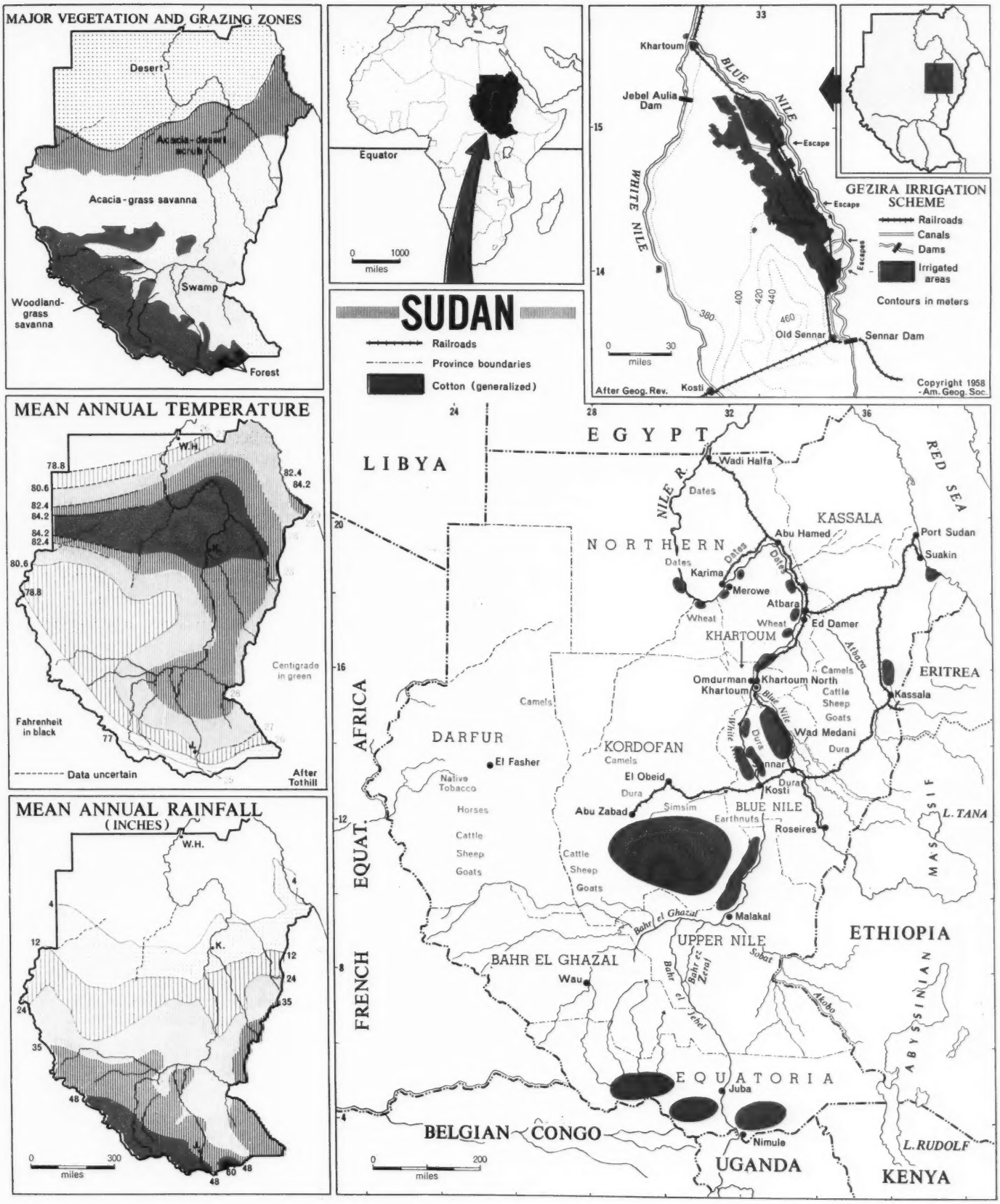
WATER FOR IRRIGATION. The annual flooding of the Nile, primarily a result of the wet season in the source regions outside the Sudan, provides water for irrigation within the country and in Egypt. The peak flow comes in late August and early September, when the flow is 16 times that of the lowest stage in April. There is always water flowing in the main channels of the Blue and White Niles, but most of their tributaries are dry during the low-water period. The beds either completely dry up or become a series of disconnected pools, a favorite playground for hippopotamuses. Underground water supplies are good where the surface of the land permits infiltration, but in the central plain the clay becomes quite impervious when wet, and little or no water sinks in.

AGRICULTURE IS THE MAINSTAY. The Sudan is almost exclusively an agricultural country. Cotton is economically by far the most important crop and has provided the basis for the great increase in prosperity during the past few decades. There are two types: the long staple, confined chiefly to large irrigation schemes, and the short staple, grown chiefly in areas of rain cultivation. Dura (generic term for various millets) is the staple food crop in all parts of the country. Some wheat is grown under irrigation as a domestic commercial crop. Sesame is the main source of vegetable oil, and is generally cultivated in the central and southern regions. Peanuts are widely grown for food and in good years some are exported. Dates occupy an important position in the economy of the Nile Valley from Khartoum north to Egypt. These food crops adequately meet the needs of the population, except with respect to sugar, tea, and coffee which must be imported to supplement local supplies.

In the southern provinces, Equatoria and Bahr el Ghazal particularly, the rainfall is adequate for most forms of tropical growth. Soils, however, are characteristically leached and erosion and loss of fertility quickly follow cultivation. Difficulty of access at present precludes much economic development, hence agriculture is mainly of the diversified subsistence type. In addition to the staple foods, the main crops are tobacco, coffee, sugar cane, rice, and palm oil.

In the zone of medium rains, extending across parts of Kassala, Blue Nile, and Kordofan Provinces, the farmers combine both rain and irrigation cultivation. Over broad, semi-arid regions a kind of shifting agriculture is practiced which involves the controlled burning of the naturally developed grass cover. Although this process precludes the accumulation of humus in the soil, it does clear the land for crops and at the same time eliminate weed growth. The Ministry of Agriculture is enforcing extensive fire-control regulations and the Soil Conservation Board is providing year-round water through the construction of numerous small reservoirs in an attempt to encourage people to settle in permanent villages and take part in the current agricultural development. In view of the rising demand for foodstuffs and the accompanying increase in mechanized farming, these central rainlands are today perhaps the greatest insurance for the country's future.

In the north practically all agricultural activity depends upon irrigation water from the Nile. Basin



Maps drawn by Vincent Kotschar

irrigation, which obtains its supply from flood-time overflow in precisely the same way as in ancient Egypt, exists in a few places. Most of the irrigation process, however, employs lift techniques ranging in size and efficiency from the traditional *shaduf* and *saqiya* to large-bore, diesel-powered pumps.

Pump irrigation has increased enormously in recent decades. Pump schemes first developed before World War I along the Nile north of Khartoum under both government and private auspices and have since spread southward along the White and Blue Niles. There are now more than 1,300 pump schemes in the Sudan, serving farms ranging in size from 20 to 20,000 acres and irrigating a total of about 400,000 acres. All of these pumps are under the jurisdiction of the Nile Pumps Control Board, which makes sure that the schemes operate efficiently in terms of land use and available water, especially during low Nile. The principal field crops grown by lift techniques in general are dura, wheat, beans, peas, and lubia (a forage crop for the bullocks that work the saqiyas).

THE GEZIRA SCHEME. The most spectacular irrigation project in the Sudan is the Gezira Irrigation Scheme. It is a classic example of what an economic development program can be, of how a thoughtful investment in a favorable combination of natural conditions may pay off in rural progress and dollars and cents.

The Gezira, Arabic for "island," is a triangular-shaped region of about 5,000,000 acres lying between the White and Blue Niles, with its base roughly at the railroad from Kosti to Sennar and its apex at Khartoum. The land slopes gently from the Blue Nile toward the White Nile and northward to the apex, hence almost all irrigation can be by gravity. The soil, with its high clay content, holds water on the surface—a factor favorable for irrigation. It was known that long-staple cotton did well here as a flood-time and winter crop. There was a fairly dense population in the region. Egypt, however, required the entire flow of the Blue Nile during its low stage. If the Gezira was to be developed, water had to be stored to maintain a supply for both Egypt and the project and it had to be raised to get it onto the land.

The Gezira Irrigation Scheme got under way in 1925 with the completion of a dam at Sennar and the opening of an elaborate canal system. Today, about a million acres produce cotton, dura, lubia, and beans in a rigidly controlled rotation system. The project is operated on a partnership basis between the Sudan government, which receives 40 per cent of the cotton crop, the tenants, who also receive 40 per cent, and the Sudan Gezira Board, which receives 20 per cent. The government is responsible for the irrigation system, the local population for the labor on the land, and the Gezira Board for practical administration and the ginning and marketing of the cotton. The tenants retain the crops other than cotton for their own use. The Gezira alone provides more than half the total revenue of the Sudan government and the Sudan Railways, which gets the cotton crop to the sea coast, provides most of the rest.

The Sennar Dam is a bifunctional structure, in that it maintains the levels of water necessary for irrigating the Gezira and is an important reservoir in the total conservation of Nile waters. Irrigation in the Gezira begins in July. The torrential Blue Nile flood passes through the dam in August, but the levels are adjusted in keeping with local requirements. After the flood has passed, the reservoir is filled to capacity up until December, then gradually the level is lowered as the needs in Egypt increase. Irrigation in the Gezira is finished by the end of March.

AMERICAN GEOGRAPHICAL SOCIETY
BROADWAY AT 156TH STREET, NEW YORK 32, N. Y.

Enclosed please find $..... to cover the following (payable in advance):

[ ] subscription (s) to FOCUS .....year (s) (1.00 per year;* $1.25 Canada, Alaska, Hawaii).
[ ] copies of the WORLD MAP (75 cents to subscribers).
[ ] copies of the FOCUS BINDER (75 cents each).
[ ] copies each of the following PAST ISSUES of FOCUS (15 cents each**) (listed on page 5).....

.....

*Group subscriptions: 25-49, 90¢ each per year; 50-99, 85¢ each; 100-499, 80¢ each; 500 and over, 75¢ each.
**Bulk rates for separate copies: 250-499 copies, 10¢ each; 500-999, 9¢ each; 1,000 and over, 8¢ each.

Name.....
(PLEASE PRINT)

Street.....

City.....State.....

FURTHER CONTROL OF THE RIVER. Another important structure in the Nile system is the Jebel Aulia Dam on the White Nile 25 miles south of Khartoum. It was built by the Egyptian government in the 1930's to hold back a portion of the late-summer flood for release during the low period from February on. This dam is solely a reservoir and its principal beneficiary is Egypt.

The importance of the Nile to the Sudan is more than obvious, but it cannot be considered without reference to the needs of Egypt. Because of the general deficiency of rainfall, Egypt is dependent upon the Nile for its very existence. The use of Nile water in one country is therefore of vital concern to the other. The sharing of Nile waters between Egypt and the Sudan is governed by the Nile Waters Agreement of 1929, which provides that the Sudan, without Egypt's consent, may not construct works which would affect the delivery of water to Egypt; Egypt, on the other hand, may not undertake conservation works without first agreeing to safeguard the interests of the Sudanese.

The basic problem of Nile control is to even out as much as possible the seasonal fluctuation between high and low waters, and to increase total delivery. This is a gigantic undertaking of international proportions. Already the Aswan, Sennar, and Jebel Aulia Dams contribute to the first aspect of the problem. The recently completed Owens Falls Dam in Uganda will add greatly to the total delivery, in that Lake Victoria, the second largest lake in the world, has become a vast reservoir. The construction of a dam at Lake Tana in Ethiopia will greatly benefit the Blue Nile both by reducing flood water and increasing the reserve. Dams at other locations are also contemplated.

Another project under study is the Jonglei Canal Diversion Scheme, which envisages the by-passing of the swamps in the Bahr el Jebel region by digging a 300-mile canal. This canal would prevent the Nile from spreading out in the Sudd, thus reducing the enormous losses of water by evaporation and transpiration. It has been shown that this project, if completed, would directly affect 600,000 and indirectly another 400,000 Nilotic tribesmen through the loss of riverine pastures and fisheries. The question is who would bear the costs, Egypt or the Sudan, both of whom would benefit from the scheme.

THE ROLE OF LIVESTOCK. Next to agriculture the most important place in the Sudanese

---

focus is published monthly (except July and August by the American Geographical Society to provide background facts and geographical interpretations of current world problems and problem areas. Subscription: $1 for 10 issues ($1.25 Canada, Alaska, Hawaii). Copies (folded) of the Society's nine-color Map of the World (about five by three feet; equatorial scale 1:30,000,000) may be purchased by all *FOCUS* subscribers at the special discount price of 75 cents each.

The American Geographical Society, a nonprofit institution, was founded in 1852. Its purpose is to collect and disseminate geographical knowledge and encourage geographical research and exploration. Membership is of seven types: Fellows (annual dues $10); Sustaining Fellows (annual dues $25); Library Membership (annual dues $25); Contributing Fellows (annual dues $100); Life Fellows (contribution $250); Patrons (contribution $1,000); Benefactors (contribution $5,000). The Society is tax-exempt under Section 501 (c) (3) of the Internal Revenue Code. Director: Charles B. Hitchcock. Contributing editors to *FOCUS*: G. H. T. Kimble and G. M. Wrigley.

Forthcoming issues of FOCUS will deal with Brazil; and Portugal.

PREVIOUS ISSUES, dealing with the following, are available at 15 cents each (payable in advance): **AFRICA:** Tunisia; Libya; Ethiopia; Somalia; Kenya; Sierra Leone; Nigeria; Belgian Congo; Federation of Rhodesia and Nyasaland; Angola; Union of South Africa; Resources of the Tropics I—Africa; Outlook for Arid North Africa: The Sahara. **ANTARCTICA. ASIA:** Korea; Formosa; Hongkong; Indonesia; Nepal; India's Population Problem; India's Languages and Religions; India's Industrial Growth; Iraq; Turkey; Resources of the Tropics III—Southeast Asia; Ceylon and the Colombo Plan. **AUSTRALIA. EUROPE:** Ireland; Scandinavia; Germany; the Ruhr; Poland; the Netherlands; France; Switzerland; Austria; Spain; Italy; Greece. **NORTH AMERICA:** California; Alaska; Outlook for the Arid Realm of the United States; New York City; British Caribbean Federation; Poliomyelitis in the United States. **SOUTH AMERICA:** Venezuela; the Guianas; Colombia; Paraguay; Uruguay; Chile; Resources of the Tropics II—South America. **U.S.S.R.:** Resources I—Heavy Industry; Resources II—Agriculture. **GENERAL:** Outlook for Steel (map only available); Outlook for Wood; Outlook for Rubber; Human Starvation; Our Most Important Mineral—Water.

Out of Print (photostats available at $1.50 each): U.S.S.R. Oil; Iran; Egypt; Israel; Morocco; Pakistan; Viet Nam; Japan; Great Britain; Yugoslavia; Resources of the Arctic; The Changing South (U.S.); Water in the United States; Puerto Rico; Outlook for Steel.